

SYMPATRY IN TWO SPECIES OF MOCKINGBIRDS ON PROVIDENCIALES ISLAND, WEST INDIES

BEVERLEA M. ALDRIDGE

The breeding ranges of two mockingbird species coincide in the West Indies (Fig. 1). The Northern Mockingbird (*Mimus polyglottos*) is found in many parts of the United States and Mexico, the Bahamas, and the Greater Antilles. The Bahama Mockingbird (*M. gundlachii*) occurs in the Bahamas, on cays off the northern coast of Cuba, and in the Hellshire Hills region of south-central Jamaica. *M. polyglottos* is found on nearly all major islands of the southern Bahamas but is usually less common there than *M. gundlachii* (Buden 1979). Conversely, *M. gundlachii* is rare and probably does not often breed in the northernmost Bahamas (sight records only, on Grand Bahama and Abaco).

Although sympatry in avian congeners has been the subject of much study (Grant 1966, Emlen et al. 1975, Hertz 1976), few of these investigations include mimids. During daily observations on Providenciales in the Turks and Caicos Islands, from December 1977-March 1978 and from December 1979-May 1980, I noted ecological and behavioral differences that seem to facilitate sympatry in *M. polyglottos* and *M. gundlachii* in the southern Bahamas.

The two species are easily distinguishable in the field. *M. gundlachii*, the larger, has conspicuous stripes on the back and flanks but lacks the extensive white patches in wing and tail found in *M. polyglottos*. Sexes are similar in both species though *M. gundlachii* females tend to have shorter tails than males. Inter-island and intraspecific variation among these populations have been discussed by Buden (1979).

STUDY AREA AND METHODS

The Turks and Caicos Islands lie on the Turks and Caicos Banks and are the easternmost islands of the Bahamas archipelago (Fig. 1). Although geographically part of the Bahamas, they are a British Crown Colony and are politically separate from the independent Commonwealth of the Bahamas. Providenciales is the northernmost of the six main islands in the Caicos chain. It is a low lying island, 23 km long and 10,500 ha in area.

According to local residents, the rainfall on Providenciales is about 64 cm annually. The heaviest rain begins in April following a dry period. This dry season usually occurs from February to late March and is a time when deciduous trees lose their leaves. The prevailing winds are from the northeast in winter, but southeasterly in summer. On Providenciales the northern coast is comprised of sandy beaches and rocky cliffs. Inland there is arid woodland at lower elevations, and limestone forest on higher ground. Salinas and tidal flats characterize the leeward southern coast where long stretches of beach and rocky terrain border the shallow waters of the Caicos Bank.



FIG. 1. Breeding ranges in the West Indies of *Mimus polyglottos* (shaded areas) and *M. gundlachi* (dashed lines) redrawn from Lack (1976).

Most of the flora is derived from Cuba, Hispaniola, and the United States (Gillis 1974). The vegetation is primarily a dense, low scrubland where poor, thin soil and exposure to salt-laden winds stunt growth; native trees rarely exceed 7 m and most are less than 4 m in height.

The two adjoining study areas which I selected provided ecological contrast and different levels of human interference. Habitat "A" consisted of 7 ha of a hilly ruderal area where a cultivated garden was surrounded by limestone forest. Many solution holes, usually with wild fig (*Ficus citrifolia*) growing in them, were found in the scrub, among trees such as lignum vitae (*Guaiacum sanctum*), sweet acacia (*Acacia farnesiana*), and wild sapodilla (*Manilkara bahamensis*). Habitat "B" consisted of sparse vegetation, a coastal strand and occasional grassy areas. Inland from the beach, low dunes merged into flat arid coastal woodland with sandy soil and many tree branches reaching to the ground. This habitat was bordered by a rock ridge with dense scrub at its base.

I used two methods for counting mockingbirds—a strip census in the first season and direct counting of territorial birds in the second. I used differences in behavior and song to identify the sex of individuals of both species; in most cases these identifications were confirmed during the breeding season. Birds that sang most of the time and showed some aggression toward mates were considered to be males. Birds that were always found perched below singing males were labeled females. In some cases these identifications were confirmed by observations of copulation.

December 1977–March 1978 census.—I censused 7 ha of habitat A by walking a standard route daily at dawn and counting all mockingbirds seen within 18 m on either side. I

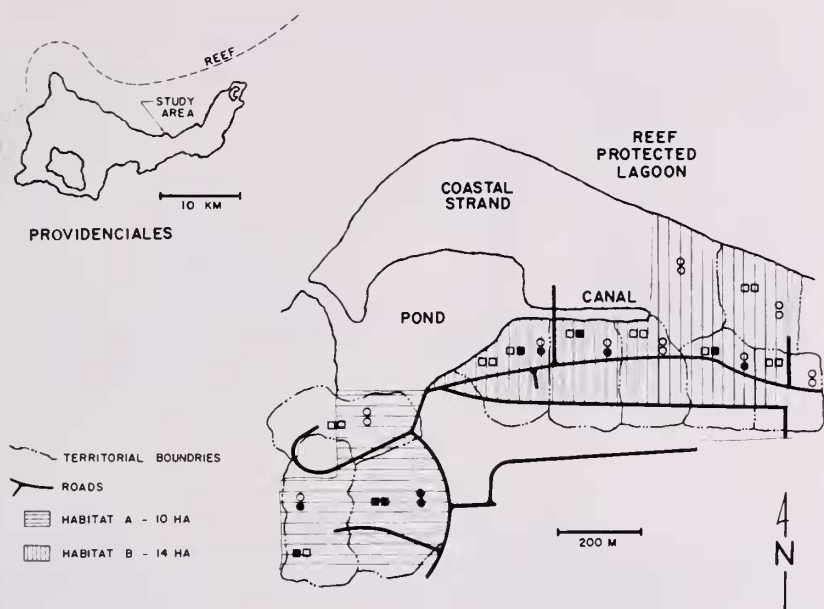


FIG. 2. Study area of Providenciales with territory holding birds and estimated territories. Circles represent *Mimus gundlachii*, and squares represent *M. polyglottos*. White indicates unbanded birds and black indicates banded birds.

occasionally left the route to confirm identification of birds heard but not seen. In December, males of both species were singing throughout the morning hours. Singing *M. gundlachii* males with females perched either beside or below them appeared to be singing to maintain territory. Singing *M. polyglottos* males, without females, appeared to be singing to attract mates and as well as to maintain territory. By late February all mockingbirds in the study areas were paired and apparently singing to maintain territory. Intraspecific border conflicts were common in both species until March when some birds were seen carrying nest material and their behavior indicated that the breeding season had begun.

I attempted to mark with paint or color band as many mockingbirds as possible. By March I had marked six, and two wore colored bands.

December 1979–May 1980 census.—I enlarged the area of habitat A to 10 ha and that of habitat B to 14 ha and attempted to capture and color band all mockingbirds found in both habitats. Birds not captured, but seen repeatedly in the same place, were considered to be territory holders and included in the count. At the same time, differences in behavior and vertical distribution in the vegetation were noted. Periodic surveys were made to count individuals present and determine their breeding status. In a final count on 30 April I found 12 banded and 28 unbanded birds holding territory (Fig. 2). Of these, one pair of *M. gundlachii* and four pairs of *M. polyglottos* were incubating eggs.

To capture birds at the edge of clearings I used a tape recorder and two mist nets strung about 3 m apart. Birds attracted to taped song usually flew over the first net and into the second one. In dense scrub I used the tape recorder with one net. *M. gundlachii* males, in response to taped *M. gundlachii* song descended to the ground to sing with the tape and

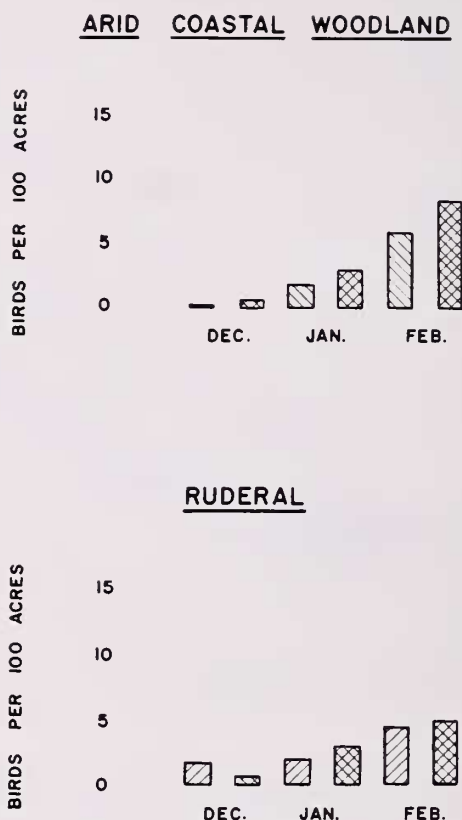


FIG. 3. The mean number of birds observed daily in the arid coastal woodland and ruderal study areas in December, January, and February (diagonal lines = *Mimus polyglottos*, cross-hatching = *M. gundlachii*).

were caught more easily than females. *M. polyglottos* responded to taped song by flying, with females following, toward the net. Members of this species did not descend to the ground and were usually caught near the top of the net.

I estimated territorial boundaries by plotting positions of color-banded birds and noting sites of intraspecific conflict. In some instances a boundary was found for *M. gundlachii* when pairs from adjoining territories approached taped *M. gundlachii* song from opposite directions; only one pair responded in a territorial manner while the other pair watched from a short distance away.

I made tape recordings of songs and calls of both species using an 18¾" (47 cm) parabolic reflector and a Panasonic tape recorder (model R.Q.345) with a tape speed of 1½ I.P.S. (5 cm per sec). In addition to using taped sounds to capture birds and determine territory, I performed experiments to assess the response of both species to their own song and to the song of the other species.

TABLE 1
FREQUENCY OF PAIR SIGHTINGS OF *MIMUS POLYGLOTTOS* AND *M. GUNDLACHII* IN ARID
COASTAL WOODLAND

Date	Species	No. pairs present	No. birds obs.	Max. possible sightings	%	Z value
Dec.	<i>M. polyglottos</i>	2	13	6	33%	0.10-0.05
	<i>M. gundlachii</i>	5	13	6	83%	0.10-0.05
Jan.	<i>M. polyglottos</i>	14	61	30	46%	0.10-0.05
	<i>M. gundlachii</i>	23	55	27	86%	0.05-0.01
Feb.	<i>M. polyglottos</i>	41	114	57	72%	0.05-0.01
	<i>M. gundlachii</i>	58	117	58	100%	0.05-0.01

RESULTS

1977-1978 census.—Fig. 3 shows the population in habitats A and B at the end of each month from December-February. The mean number of birds per day present in A was significantly greater in January than in December (Student's *t* test, $t = 3.91$, $P \leq 0.01$) and further increased from January to February ($t = 3.33$, $P \leq 0.01$). Similarly in habitat B, the average number of birds per day was higher in January than December ($t = 3.59$, $P \leq 0.01$) and higher again in February than January ($t = 3.23$, $P \leq 0.01$).

Both species were distributed in an approximate 1:1 ratio in both study areas. After pair formation in February one pair of each species shared the 10 ha of habitat A and four pairs of *M. gundlachii* and three pairs of *M. polyglottos* shared the 14 ha of habitat B. Table 1 shows the number of pair sightings given as a percentage of the maximum number possible based on total number of individuals observed. The number of pair sightings was significantly higher for *M. gundlachii* during each of the three census months December-February (Fig. 4).

Habitat preference.—*M. gundlachii* was usually sighted in semi-dense scrub and on high song perches in acacia and sapodilla trees and was seldom seen in open grassy areas where the vegetation was low and very sparse. *M. polyglottos* often shared the semi-dense scrub with *M. gundlachii* as well as many of the high song perches, but was more numerous near human habitation and at the edge of clearings. *M. polyglottos* was most common in sparse scrub and grassland. Both species were found, at least occasionally, in most of the different major habitats on the island including beach strand, scrublands, and arid woodlands.

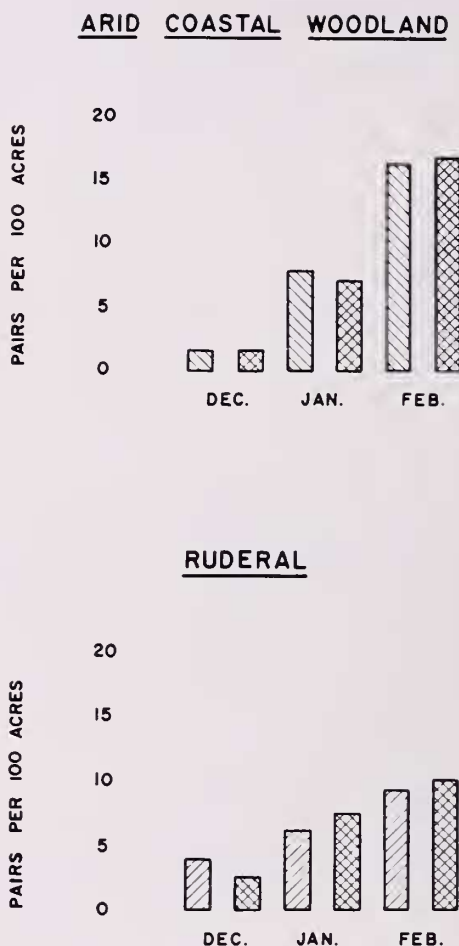


FIG. 4. The mean number of mockingbird pairs observed daily in the arid coastal woodland and ruderal study areas in December, January, and February (diagonal lines = *Mimus polyglottos*, cross-hatching = *M. gundlachii*).

Vertical distribution in vegetation.—Figs. 5 and 6 show daylight observations of the species' vertical segregation and overlap in both habitats. Student's *t* test for significance of independent means for December–March showed that *M. gundlachii* occupied the highest levels in the vegetation both in habitat A ($t = 1.70$, $P \leq 0.05$) and in habitat B ($t = 4.3$, $P \leq 0.05$).

In habitat A both species frequently shared the same levels after 15

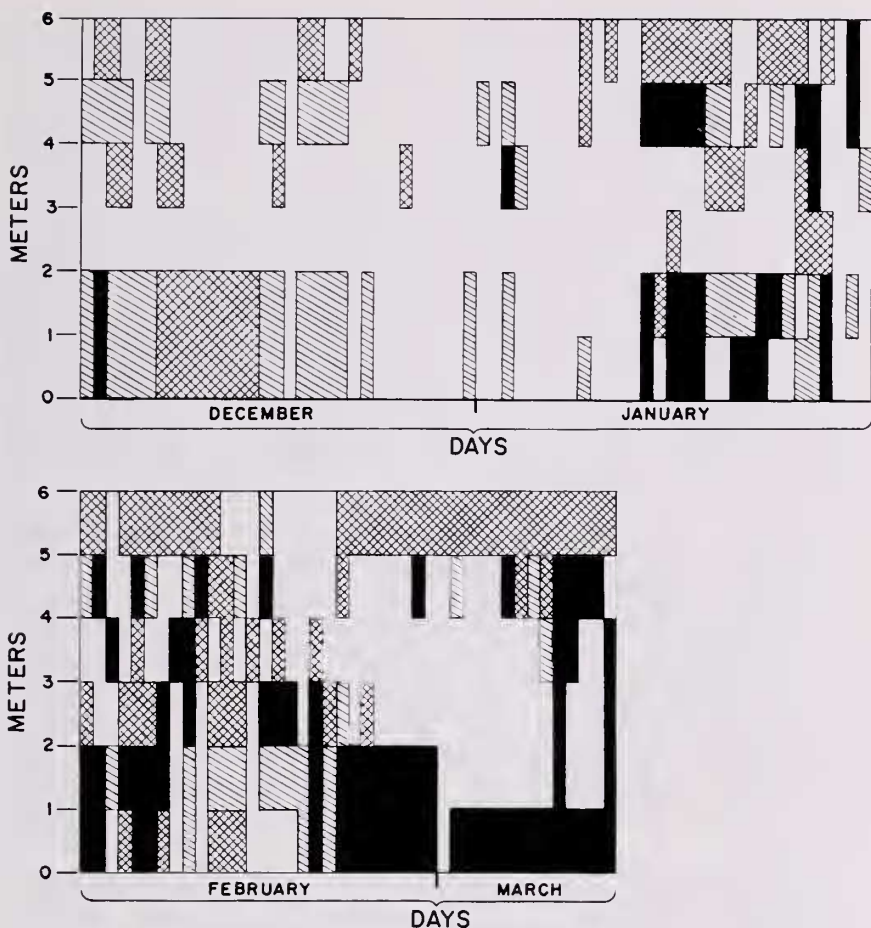


FIG. 5. Vertical distribution of perching birds in the vegetation of the ruderal study area (diagonal lines = *Mimus polyglottos*, cross-hatching = *M. gundlachii*, solid blocks = both species perching together).

January. The presence of both species at ground level can be explained by competition for food, and sharing of high levels during competition for song perches. In habitat B, *M. gundlachii* usually occupied levels above those of *M. polyglottos* (Fig. 6).

Territoriality and food partitioning.—In December interspecific aggression was common between two color-banded pairs of mockingbirds holding territory in habitat A. Aggression was mostly seen between the two males while they foraged at fruit trees or shrubs harboring wooly aphids.

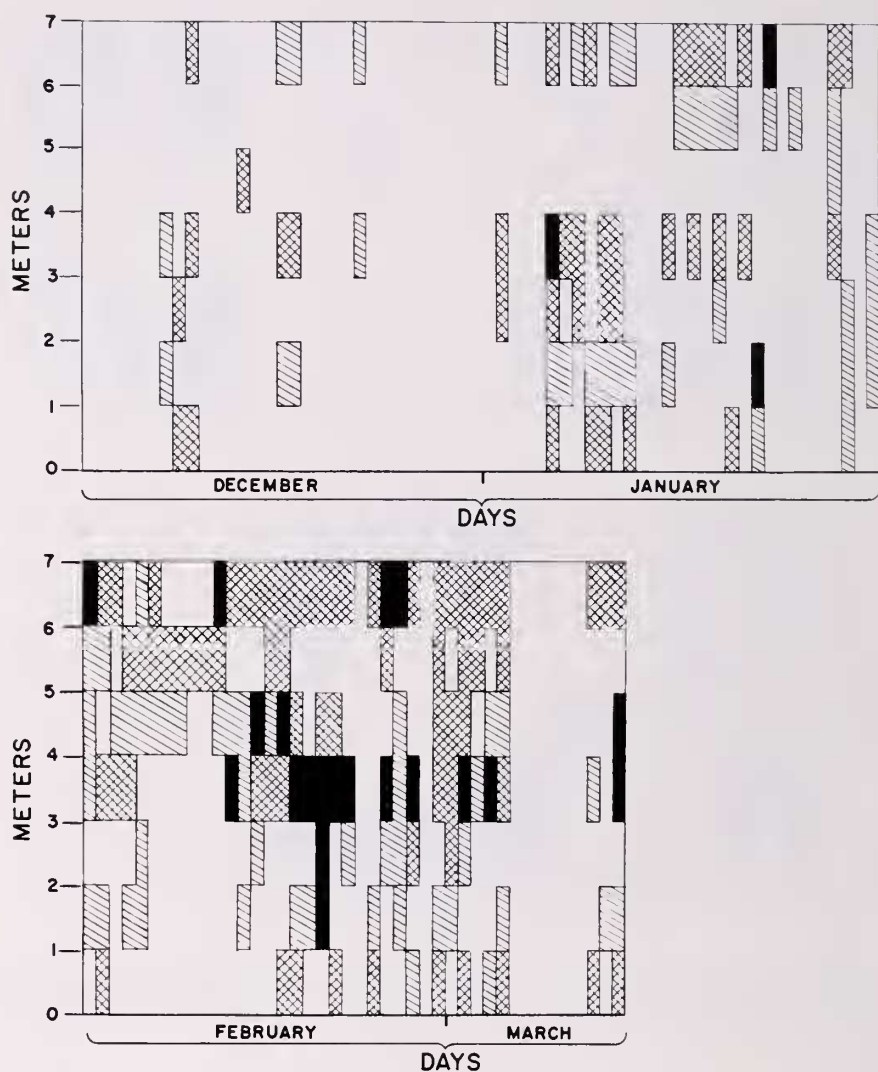


FIG. 6. Vertical distribution of perching birds in the vegetation of the arid coastal woodland study area (diagonal lines = *Mimus polyglottos*, cross-hatching = *M. gundlachii*, solid blocks = both species perching together).

In conflicts over food the male *M. gundlachii* usually put the *M. polyglottos* to flight. Conflicts gradually lessened in early January, each species began foraging at different times and food sharing became apparent. From time to time aggression again occurred at food sources (such as ripening

fruit) as they became available. After initial contact each species began to forage separately and aggression ceased.

The pair of *M. polyglottos* holding territory in habitat disappeared on 4 March. The disappearance could have resulted from recapture; the female was sighted outside the study area but the male was never seen again. This pair had been captured in a trap and seemed to suffer some trauma afterward. Four days later another pair of *M. polyglottos* arrived in the area occupied by the above pair and stayed to forage. Interspecific aggression began again, but in this case the new male *M. polyglottos* attacked the *M. gundlachii* pair frequently. Some encounters ended with abrupt flight by both species, but others involved attacks by *M. polyglottos* on *M. gundlachii*. At times male *M. gundlachii* seemingly remained oblivious, however, on one occasion a male flew directly from his perch landing on the back of a *M. polyglottos* (sex unknown) foraging at a pepper bush (*Capsicum annum*). The attack resembled an attempt at copulation from which the *M. polyglottos* retreated calling vociferously. Aggressive encounters lessened in both numbers and intensity as the *M. polyglottos* pair remained to breed and forage in the same area with the *M. gundlachii* pair.

In habitat B where food was plentiful, only one instance of aggression at a food source was noted. Aggressive displays, however, were common at the song perch of a male *M. gundlachii* marked on wing and tail with orange paint. This male sang longer and more vigorously than others, occupied the highest tree in the habitat, and was often under attack by other *M. gundlachii*. Other singing *M. gundlachii* males were seldom approached by rivals, but in instances when they were the female drove off the intruders.

Between *M. gundlachii* pairs, aggression seemed limited to border conflicts with "growling" and feather-fluffing displays that invariably attracted *M. polyglottos*. In *M. polyglottos* the "attack and chase" intraspecific territorial defense was first noted during mate selection when singing males left the song perch to chase intruders. Growling was common among groups of *M. polyglottos*. Interspecific aggression was observed when five *M. gundlachii*, growling and exhibiting agonistic behavior, were attacked by one *M. polyglottos* in typical "attack and flee" fashion. Interspecific aggression was noted again when one *M. polyglottos* (sex unknown) attacked the orange painted male *M. gundlachii*. In this instance, the *M. polyglottos* adult was accompanied by two juveniles begging for food and it left them to attack the male *M. gundlachii* on his song perch. The *M. gundlachii* retreated and the *M. polyglottos* remained to sing a few phrases before rejoining the young.

Vocalizations.—The primary song of *M. gundlachii* is a series of low

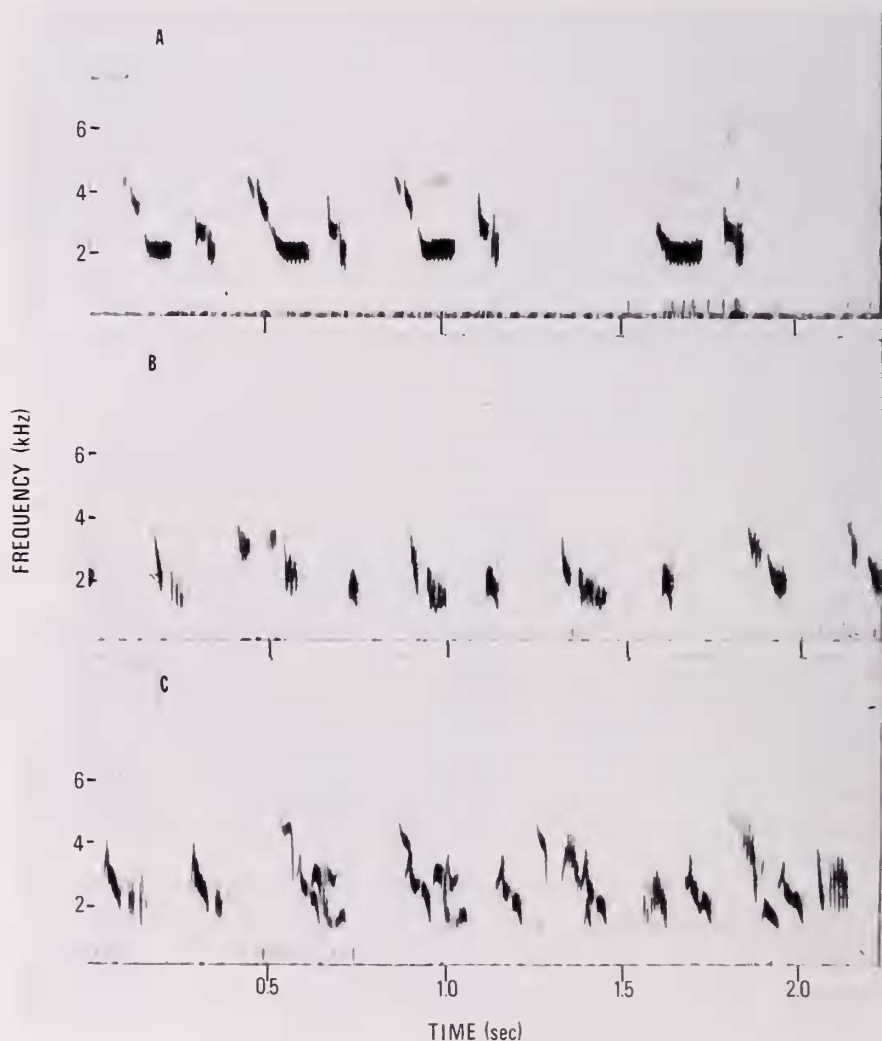


FIG. 7. Songs of mockingbirds from Providenciales Islands: A. *Mimus polyglottus*; B. *M. gundlachii*; C. duet of both species.

reiterated syllables interspersed with occasional trills and chuckles (Figs. 7A and B). It is less strident than *M. polyglottus* whose versatility, defined by the number of song patterns used (Howard 1973), is high. *M. gundlachii* song was heard at different times of the day on almost every day during winter. Individuals of this species were most vocal in March and April when singing began before dawn and continued intermittently until dusk.

M. polyglottos was seldom heard before dawn, but often in the morning. When males began advertising in February, *M. polyglottos* song was heard throughout the daylight hours and sometimes in the evening. Both species sing all winter, but *M. gundlachii* sings more often than *M. polyglottos*.

Growling and chirping were often heard between pairs of both species, but whisper songs were heard only from *M. gundlachii*. Whisper songs are sung from a low perch with closed bill. The alarm call of *M. gundlachii* is a low sharp chirp. In *M. polyglottos* this call is two sharp chirps. To my ear, parts of *M. gundlachii* song seemed similar in pitch, rhythm, and phrasing to that of *M. polyglottos*. The similarities may be the result of mimicking on the part of *M. polyglottos*. On Providenciales I heard *M. polyglottos* mimic the Blackfaced Grassquit (*Tiarus bicolor*), the Blue-gray Gnatcatcher (*Poliophtila caerulea*), Ospreys (*Pandion haliaetus*), and American Kestrels (*Falco sparverius*) in the winter months, and Laughing Gulls (*Larus atricilla*) that were courting in April.

Predawn antiphonal singing was common only in *M. gundlachii* and appeared to be a daily ritual unless the weather was stormy. Heard just before dawn, it continued until sunrise. Distinctly different from primary song, it consisted of one or two long phrases repeated note for note by another *M. gundlachii* in an adjoining territory.

Sexual display consisted of short leaps (often accompanied by song) above the song perch. This display was performed by both male and female paired *M. gundlachii*, and male *M. polyglottos*. Individuals of both species used tall trees for song perches; the orange-painted male *M. gundlachii* used the tallest tree in habitat B. The song of this male increased in length and intensity after mid-February. With few pauses, the song lasted 3–4 h. In one instance, a *M. polyglottos* (sex unknown) twice attempted to sing with this male but the female *M. gundlachii* attacked the intruder and it flew away. The female often interrupted this male's song by alighting on the same perch and growling harshly. This behavior was common in *M. gundlachii* females throughout the winter. *M. polyglottos* females exhibited this trait only during the breeding season, and then to a lesser degree.

Specific trees were chosen as song perches and it appeared, like the food sources, they were shared by both mockingbird species. In late February *M. gundlachii* was occasionally seen on a perch usually taken by *M. polyglottos*. Usually, once taken over by *M. gundlachii*, perches were not changed again. In some cases, when a *M. polyglottos* vacated a perch for no known reason, a male *M. gundlachii* would claim it without interspecific aggression. I did see once, however, the use of song for displacement of *M. polyglottos* from a high perch when a male *M. polyglottos*, after advertising from a sapodilla, was challenged by a male *M. gundlachii*

singing below. This male alighted on the song perch and began to duet with the *M. polyglottos* (Fig. 7C). I observed this situation for three successive mornings until the *M. polyglottos* disappeared and the *M. gundlachii* sang alone from the perch every morning. Neither female took part in these incidents but waited quietly in the scrub.

M. gundlachii began singing more vigorously in March. By April, many females were vocalizing with males by interrupting primary song. The song between male and female then became antiphonal. It seemed to represent an intense dialogue between them. Female *M. polyglottos* did not sing at any other time except just before, or immediately after copulation. Sung randomly from a perch, the song is not antiphonal.

Courtship.—Female *M. gundlachii* constantly attended the males. They usually perched below males and when males flew or foraged on the ground, they followed closely behind. Because most *M. gundlachii* were paired by December I was not able to study mate selection in this species. On 2 February I observed what I took to be pre-copulatory behavior in *M. gundlachii* when a female gained attention of the male as he foraged on the ground by approaching and growling. A display followed with the birds circling, bowing and leaping with feathers fluffed and wings drooping. The episode ended when the male, with lowered head, chased the female into the scrub. I did not see any copulations in this species.

When a female *M. polyglottos* responded to male song, acceptance by the male was preceded by male chasing and female avoidance with both birds growling. In one color-banded pair, acceptance took place on 9 December but copulation was not seen until 22 January. In this courtship, mate acceptance, accompanied by excited behavior of both birds, was followed by a quieter period of several weeks of roosting, flying, and foraging together. A change in behavior of a female occurred when she began to appear more often on the song perch with the male, fluffing feathers, growling, and fluttering around him. On one occasion a female called to a singing male from a nearby perch and assumed a crouching posture. The male approached by direct flight and with a slight swoop above the female, settled on her to copulate. This occurred three times during the first day of copulation. The next day the male sang in a subdued manner then suddenly descended to the ground to copulate as the female held nest material in her bill. This behavior was noted twice on the second day, after which I saw no more copulations. This female, and all others observed, uttered loud calls during copulation.

Foraging.—Both species are omnivorous. Food items for both include young anoles (*Anolis* sp.), caterpillars, agave nectar, and a wide variety of seeds and fruits (pers. obs.). While foraging on the ground, both species turn leaf litter and small stones with their bills. Many food items were

too small or were taken too rapidly to identify. *M. gundlachii* ran quickly on sandy soil beneath trees and shrubs searching at random and only stopping to seize and ingest prey. *M. polyglottos* was more deliberate and dug unhurriedly, waiting quietly and often wingflashing. *M. gundlachii* sometimes quivered wings while foraging, but did not usually use the wingflash as a hunting technique. Both species often perched near fruiting trees. Pits were regurgitated, often in the middle of a song.

Response to playbacks.—*M. gundlachii* reacted immediately to playbacks of *M. gundlachii* song and approached to sing antiphonally with the tape. Females, always nearby, sometimes joined their mates in feather-fluffing close to the tape recorder. The pairs circled the recorder and the males often turned, spreading their tail feathers and growling at the females while pecking at them. Although response was weaker with successive playbacks, *M. gundlachii* males never failed to respond. Females, however, did not respond to successive playbacks. Playbacks of female *M. gundlachii* song were ignored by both sexes. When *M. polyglottos* pairs were in breeding condition they responded more readily to playbacks of their own song but never as vigorously as *M. gundlachii*. *M. polyglottos* did not descend to the ground, lost interest faster, was less excited, and more cautious than *M. gundlachii*. *M. polyglottos* females followed males to the tape but kept a short distance away and apart from an occasional growl remained quiet. Neither species responded to the call of the other species, but distress calls of *M. gundlachii* brought *M. polyglottos* to observe.

Wingflashing.—*M. polyglottos* often wingflashed while foraging. Wingflashing commonly occurred on open ground in grassy areas and from low branches before catching an insect. Sudden encounters with *M. gundlachii* and the sight of a baited trap also elicited wingflashes. The wingflash begins as a slow forward motion of the wings with a very slight hesitation before a full stretch above the back. The bird's gaze is fixed on an object, the body is quite still, and the white wing patches are fully exposed. Ten wingflash incidents for different stimuli by a marked *M. polyglottos* in habitat A from 1 December–5 March (when the bird disappeared) were: once, when foraging in a tree; three times, seemingly evoked by the presence of a trap; two times in the presence of *M. gundlachii*; and three times by unknown stimuli. Out of 60 observations there were 19 incidents (31.5%) of wingflashing. Each incident involved anywhere from one–five wingflashes in succession. Wingflashes were uncommon in *M. gundlachii* in which white wing patches were lacking. In this species I saw wingflashing incidents only twice; once on my sudden approach through the scrub and once while this species was foraging on the ground. M. H. Clench (pers. comm.) observed wingflashing in *M. gundlachii* only once—on uninhab-

TABLE 2
NEST MEASUREMENTS FOR *MIMUS POLYGLOTTOS* AND *M. GUNDLACHII*

Species	Date	No. eggs	Outer diam. (cm)	Depth (cm)	Tree species used	Nest height (m)
<i>M. polyglottos</i>	12 Mar. '78	2	20	9	<i>Casasia clusifolia</i>	2.0
<i>M. gundlachii</i>	27 Mar. '78	0	23	12	unidentified shrub	1.5
<i>M. polyglottos</i>	22 Jan. '80	1	16	7	<i>Hypelate trifoliata</i>	1.5
<i>M. polyglottos</i>	30 Mar. '80	3	16	8	<i>Hypelate trifoliata</i>	1.5
<i>M. polyglottos</i>	18 Apr. '80	2	20	9	<i>Guaiacum sanctum</i>	2.4
<i>M. polyglottos</i>	19 Apr. '80	3	18	8	unidentified shrub	1.5
<i>M. gundlachii</i>	24 Apr. '80	2	24	12	<i>Coccothrinax argentata</i>	1.5

ited Little San Salvador Island (Bahamas). One individual approached to within 60 mm while she was seated on the ground and repeatedly wingflashed at her.

Nidification.—Table 2 provides nesting data for two pairs of *M. gundlachii* and three pairs of *M. polyglottos*. The two nests of *M. gundlachii* were cup-shaped and cryptic and the brownish-gray of the incubating bird blended well with the surrounding vegetation. I saw both sexes bring nest material for construction but was unable to determine whether both birds built the nest. Not all nests were well concealed and those not were probably subject to predation by American Kestrels, Cuban Crows (*Corvus nasicus*), and feral cats (*Felix cattus*). At one nest the male *M. gundlachii* guarded from a tree while the female incubated, but the nest, not well concealed, was left unprotected when both birds flew away together to forage.

M. polyglottos built smaller, cup-shaped nests (made of twigs and bark and lined with palm fiber) than did *M. gundlachii*. One found near human habitation contained bits of rag and tissue. *M. gundlachii* nests were made of similar material (but lacked man-made items in their construction). *M. polyglottos* nests were well concealed and inaccessible when built in the prickly purple shrub (*Oplonia spinosa*) common to the island. Male *M. polyglottos* guard the nest during incubation, help the female find food, and feed the young.

DISCUSSION

Although interbreeding between *M. polyglottos* and *M. gundlachii* has been recorded from New Providence, Bahamas, I saw no evidence of this between the two mimid populations on Providenciales. From this study certain differences in behavior and ecology of the two species have emerged. It seems likely that they are reproductively isolated.

On islands where the total number of birds is limited by area, similar species tend to occupy a wide range of habitats and share common food sources (Crowell 1968). This may be the case with the two mockingbirds on Providenciales but some ecological separation is evident. *M. gundlachii* is not found in grassland and sparsely vegetated regions and is less common near settlements. *M. polyglottos* is found in these habitats as well as in those habitats occupied by *M. gundlachii*.

In examining the function of foraging characteristics, differences, if they are significant, may be species-specific or just local adjustments to the immediate biotic environment (Hamilton 1962). The stationary wingflash foraging of *M. polyglottos* is distinctively different from the haphazard foraging of *M. gundlachii*.

The song of *M. gundlachii* is low pitched and less variable than the intricate, diverse song of *M. polyglottos*. *M. gundlachii* sings antiphonally with other male *M. gundlachii* and with female *M. gundlachii* during the breeding season. Whisper songs are common in this species but *M. gundlachii* does not mimic other species. During this study *M. polyglottos* did not sing antiphonally or sing whisper songs but did mimic other species.

The behavior of female *M. polyglottos* toward mates differed from that of female *M. gundlachii*. Female *M. gundlachii* frequently interrupted the song of their mates by growling, whereas this behavior was not seen in female *M. polyglottos*.

In response to playbacks of *M. gundlachii* song, female *M. gundlachii* followed their mates to the tape recorder and sometimes fluffed their feathers. Female *M. polyglottos* did not follow their mates to the tape recorder in response to playbacks of *M. polyglottos* song and were less agitated than female *M. gundlachii* in this situation. *M. gundlachii* males responded vigorously to playbacks of their own song; by comparison, *M. polyglottos* males gave a much weaker response to their own song.

When *M. gundlachii* males are singing, *M. gundlachii* females defend the song perch (or the male) against intruders. I did not see *M. polyglottos* females defend the song perch or attack intruders. The male *M. polyglottos* chases intruders away and in defense of territory, attacks.

The impression gained through my observations on Providenciales is one of *M. polyglottos*, the smaller congener, co-habiting with *M. gundlachii* with apparent compatibility. Interspecific aggression, though present sometimes, does not predominate.

SUMMARY

In the winter months of 1977–78 and 1979–80, I studied the behavior of the Northern (*Mimus polyglottos*) and the Bahama (*M. gundlachii*) mockingbirds on the island of Providenciales in the West Indies. This study was undertaken to help identify the factors that permit sympatry between these congeners.

I conducted censuses in two study areas and collected data on territoriality, song, food requirements, habitat preference, and nidification. Song recordings were made for use in playback experiments and for capture and banding.

Because of differences in habitat choice and use, co-occupancy of habitat by the two species occurs with minimal aggression. Interspecific aggression is rare when food is abundant but common when food is less abundant. Here, after initial aggression, food sites are shared. Interspecific territorial disputes were common and there is evidence that *M. gundlachii* uses song to avoid aggression.

Territorial boundaries were estimated by plotting positions of color-banded individuals. As the breeding season approached, *M. gundlachii* gradually displaced *M. polyglottos* from the highest song perches, often by vigorous song.

Generally the breeding season for both species was the same. However, peaks of breeding in the two species occurred at different times.

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